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U. S. NAVAL HOSPITAL
ARTIFICIAL LIMB DEPARTMENT
MARE ISLAND, VALLEJO, CALIFORNIA

DOCUMENTS SECTION

28 February 1949

To: Medical Officer in Command

Subj: Monthly report of the Experimental Work of the Artificial Limb Department.

Ref: (a) Advisory Committee on Artificial Limbs ltr dtd 21 June 1948.

1. Monthly report required by reference (a) is hereby submitted.
2. Final arrangements are being completed for the school of below-knee and below-elbow prostheses, to be held from March 28th to April 6th, 1949, inclusive.
3. A request has been received to provide the Australian Government Repatriation Commission with a sample set of artificial arms and legs of the type that is being manufactured at Mare Island. These models are being manufactured and will be forwarded to the Australian government when completed.
4. The following projects are under production, experimentation and further study:

(a) Lower Extremities Section:

I. Foot and Ankle

Dies are being manufactured for moulding the rubber bumper blocks. The cosmetic ankle blocks are now being fitted directly into the shins, and the sponge rubber (mopstock) filler is being finished with flesh-colored latex. This gives a durable coat to the sponge rubber filler and still blends into the foot and shin in a good cosmetic manner, in both shape and color.

II. Shank

The new cosmetic shank, together with the ankle block, is being used on the below-knee legs. The top of the shin requires alterations from the normal cosmetic shape in order to successfully fit the cosmetic knee block when utilized for an above-knee leg. It is planned to allow the shape of the kneecap to remain in the top of the shin and have the knee block fitted behind the shin.

III. Knee

A. Mechanical

The cosmetically shaped knee block will require an alteration in the mechanical knee joint in order to provide the space and allow the thigh socket to be fitted to the top of the knee bolt, and still provide for a minimum of 125° knee flexion. The altered knee stop has been designed and is being fitted on an amputee, in order to test its effectiveness. The principle utilized in conjunction with the knee joint is the same as the previous design, with the exception that the knee stop may swing inside the shin in an anterior-posterior plane. A snubber is attached to the brake in order to prevent noise as the knee stop touches the posterior and/or anterior part of the shin.

IV. Cosmetic Problem

Several companies have been contacted and requested to provide a sponge rubber material, flesh colored, of 1/8 inch thickness. The present Spectrafoam, 1/4 inch in thickness, is believed to be excessive, especially for a shin which is small in circumference. The thinner sponge rubber should give the same cosmetic characteristics, providing its density is greater than Spectrafoam. It will allow more space, especially in the ankle—where space is critical, because of the necessity of utilizing a full size rubber ankle block. A saving of 1/8 inch in radius would be highly desirable.

V. Brief summary of status of models as a unit.

The hydraulic tilting table continues to function satisfactorily on an amputee. The hip joint has been redesigned with new specifications, particularly in strength, in order to eliminate the inside track and roller between the thigh-piece and the socket. The hydraulic knee lock principle being utilized in the tilting table is evidently a great improvement in providing an amputee with a prosthesis he is able to use with greater skill and security. Additional units are being manufactured in order to test additional cases, including amputees with extremely short stumps. The conventional type of prosthesis that has been furnished for extremely short above-knee stumps has been very unsatisfactory.

Work continues on the fitting of below-knee suction sockets on a number of cases. Cases wearing this type of prosthesis are undergoing field testing.

B. Upper Extremities Section:

I. The below-elbow joint has been redesigned and has undergone successfully tests in an accelerated testing machine, plus tensile strength tests, to a highly satisfactory degree.

II. Hands, Hooks and Tools

Additional Robinson hands are being provided for selected cases in order to field test this appliance.

The problem of interference between the gauntlet of the plastic glove and the cable control has been overcome by utilizing a short section of cable housing attached to the base of the hand mechanism, and ending at the proximal edge of the gauntlet.

III. Cosmetic Problem

No work has been done on the cosmetic problem of the arm this month.

IV. Harness and/or other outside control.

A new type cable and cable housing has been received from the Sierra Engineering Co., and is being fitted to two amputees in order to test its effectiveness in actual practice.

V. Brief summary of status of models as a unit.

The Northrop Simplex arm is being worn by an above-elbow amputee. He

complains that a single hook and elbow flexion control is often unsatisfactory because when he grasps an object and then tries to flex the arm the hook opens and the object falls. The clothing interferes with the cable control and the arm is quite bulky. The power of lift in the Simplex arm is much less than that in the Navy-Fitch arm. His achievement in the use of the arm is slower when compared to his use of the Navy-Fitch appliance. These criticisms are inherent with every type of arm using a single control principle.

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